

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): SADOT, Emek	Conf. No.: 2558
Application No.: 10/072,364	Art Unit: 2194
Filed: February 6, 2002	Examiner: ANYA, Charles
Title: CLIENT-CONTROLLED LOAD BALANCER	

Commissioner for Patents  
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**APPLICANT'S APPEAL BRIEF**

Sir:

A Notice of Appeal was filed in the above application on April 2, 2010, with a Request for Pre-Appeal Brief Review. A Notice of Panel Decision from Pre-Appeal Brief Review dated April 23, 2010, indicated that at least one actual issue for appeal was found to exist and that the application should proceed to the Board of Patent Appeals and Interferences. Applicant is filing this Appeal Brief within two months of the date of the Notice of Appeal as required by 37 C.F.R. 41.37.

The Appeal Brief fee was paid on March 25, 2009, in connection with an earlier Appeal, and prosecution was subsequently reopened. Pursuant to MPEP 1207.04, it is respectfully requested that that fee be applied to the present Appeal Brief, and it is respectfully submitted that no further Appeal Brief fee is due at this time.

I. REAL PARTY IN INTEREST

The real party in interest in the above-captioned application is Avaya Communication Israel Ltd. as shown by the assignment recorded at patent Reel 012586, Frame 0847 on February 6, 2002.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings known to appellant, the appellant's legal representatives or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-54 are pending in the subject application. No claims are cancelled. No claims have been withdrawn from consideration. No claims are objected to. Claims 1-54 are rejected. The rejections of claims 1-54 are being appealed.

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1

Claim 1 recites a method of selecting a server (108 in Figure 1) to represent a virtual server hosted by a plurality of servers. The method includes providing by a load

balancer (102 in Figure 1) not associated with the virtual server values for one or more parameters of two or more paths, each path defined between a point in a vicinity of a client accessing the virtual server and one of the plurality of servers representing the virtual server (page 3, lines 1-10). The method also includes selecting a server to provide data for the client responsive to the values of the one or more parameters (page 3, lines 10-12). The load balancer (102 in Figure 1) comprises a client-controlled load balancer that directly selects the one of the plurality of servers representing the virtual server based on the one or more parameters (page 3, lines 10-12; page 10, line 24 - page 11, line 6).

#### Claim 24

Claim 24 recite a method of selecting a server to be accessed that includes receiving by a load balancer (102 in Figure 1) a message relating to a virtual server, hosted by a plurality of servers (page 3, lines 1-2), and to a client desiring to receive data from the virtual server (page 3, lines 19-24). The method also includes selecting by the load balancer one of the plurality of servers to provide data to the client based on one or more parameters related to a path to the client (page 3, lines 10-12). The load balancer is closer to the client than to the selected server (page 6, lines 5-10; page 8, lines 24-28), and the load balancer comprises a client-controlled load balancer that directly selects the one of the plurality of servers representing the virtual server based on the one or more parameters (page 3, lines 1-12; page 10, line 24 - page 11, line 6).

Claim 37

Claim 37 recites a method of selecting a server to be accessed that includes receiving by a load balancer (102 in Figure 1) a message relating to a virtual server hosted by a plurality of servers (page 3, lines 1-2) and to a client desiring to receive data from the virtual server (page 3, lines 19-24). The method also includes selecting by the load balancer one of the plurality of servers to provide data to the client (page 3, lines 10-12) at least partially responsive to the cost of communications between the client and one or more of the plurality of servers (page 10, lines 30-33). The load balancer comprises a client-controlled load balancer that directly selects one of the plurality of servers representing the virtual server based on said one or more parameters (page 3, lines 1-12; page 10, line 24 - page 11, line 6).

Claim 41

Claim 41 recites a load balancer (102 in Figure 1) that includes an interface adapted to receive server access messages from clients (page 9, lines 3-7 and Figure 1) and a processor adapted to determine for at least one of the messages whether the message requires load balancing responsive to at least one attribute different from the identity of the server referenced by the message (page 10, lines 1-17). The processor is adapted to select for at least one message determined to require load balancing a server to service the client (page 7, lines 4-9; page 9, lines 3-7; Figure 4). The processor comprises a client-controlled processor that directly selects the server to service the client based on the at least one attribute (page 3, lines 1-12; page 10, line 24 - page 11, line 6).

Claim 47

Claim 47 recites a method of selecting a server to be accessed that includes receiving by a load balancer (102 in Figure 1) a message relating to a virtual server hosted by a plurality of servers (page 3, lines 1-2) and to a client desiring to receive data from the virtual server (page 3, lines 19-24). The method also includes choosing a function from a plurality of predetermined functions utilized by the load balancer for selecting servers, responsive to the received message (page 7, lines 16-20). Also, selecting, by the load balancer, one of the plurality of servers that minimizes or maximizes the chosen function, to provide data to the client (page 7, lines 21-22). The load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server that minimizes or maximizes the chosen function page 3, lines 1-12; page 10, line 24 - page 11, line 6).

Claim 52

Claim 52 recites a method of selecting a server to be accessed by a client via a wide area network (WAN) (110 in Figure 1) from among a plurality of servers associated with a domain name (page 8, lines 12-24). The method includes providing a client-controlled load balancer (102 in Figure 1) in a local area network (LAN) (104 in Figure 1) connected to the WAN, the LAN including the client. Also receiving at the load balancer a list of addresses of servers hosting the domain name (page 8, lines 12-23) and selecting by the load balancer one of the addresses of the plurality of servers based on a parameter related to a path between a point in the vicinity of the client and one of

the plurality of servers (page 10, lines 24-33).

#### VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-4, 6-9, 11, 15, 17, 24-29 and 32-36 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,182,139 to Brendel (hereinafter, "Brendel") in view of U.S. Patent No. 6,185,619 to Joffe (hereinafter, "Joffe").

Whether claim 5 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 6,658,479 to Zaumen (hereinafter, "Zaumen").

Whether claim 10 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 7,174,390 to Schuler (hereinafter, "Schuler").

Whether claim 12 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 6,389,462 to Cohen (hereinafter, "Cohen").

Whether claims 13, 14, 30 and 31 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 6,304,913 to Rune (hereinafter, "Rune").

Whether claim 16 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 6,249,801 to Zisapel (hereinafter, "Zisapel").

Whether claims 18-21 are properly rejected under 35 U.S.C. 103(a) as being

unpatentable over Brendel in view of Joffe and further in view of U.S. Patent No. 6,950,848 to Yousefi'zadeh (hereinafter, "Yousefi'zadeh").

Whether claims 22 and 23 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and Yousefi'zadeh and further in view of U.S. Patent No. 6,154,777 to Ebrahim (hereinafter, "Ebrahim").

Whether claims 37-40 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Zaumen.

Whether claims 41-45 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Ebrahim.

Whether claim 46 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Ebrahim and further in view of Cohen.

Whether claims 47, 50 and 51 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Yousefi'zadeh.

Whether claims 48 and 49 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Yousefi'zadeh in view of Ebrahim.

Whether claim 52 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,078,960 to Ballard (hereinafter, "Ballard") in view of Joffe.

Whether claim 53 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard in view of Joffe and further in view of Ebrahim.

Whether claim 54 is properly rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard in view of Joffe and further in view of U.S. Patent No. 7,043,563 to Vange (hereinafter, "Vange").

## VII. ARGUMENT

A. A Prima Facie Case of Obviousness Has Not Been Presented  
In Connection with Any Claim

Each of the individual claim rejections is addressed below under separate headings as required by the 37 C.F.R. 41.37(c)(vii). However, as an initial matter, it is respectfully submitted that none of the outstanding rejections under 35 U.S.C. 103(a) satisfy the requirements of MPEP 706.02(j) and that none of these rejections present prima facie showings of obviousness. For at least this reason, it is believed that all outstanding rejections are improper and should be withdrawn.

MPEP 706.02(j) requires that, in order to support a rejection under 35 U.S.C. 103(a), an examiner must explain what limitation of a claim is not satisfied by a primary reference and then identify “the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter....” Each outstanding rejection in this application indicates that a primary reference fails to satisfy a certain claim limitation and that it would have been obvious to modify the primary reference “with the teachings of” a secondary reference. For example, the rejection of claim 1 indicates that it would have been obvious “to modify the system of Brendel with the teaching of Joffe.” No further explanation as to how the primary reference should be modified is provided.

Stating that some unspecified modification to the primary reference should be made does not constitute an explanation as to how the primary reference should be modified to arrive at the claimed subject matter. In the present case, the examiner attempts to modify Brendel’s system with teachings from various conventional load balancing systems. However, Brendel specifically provides that his system “...cannot



perform traditional load balancing without knowledge of the loads of each server at the server farm, or knowledge of the requests from other clients.” Brendel acknowledges this shortcoming of his system and does not propose any way to address it. Asserting that Brendel’s system should be modified in some unspecified manner using conventional art does not constitute an explanation as to how to make Brendel’s system perform the methods of the pending claims.

In the final Office Action, the examiner responded to similar arguments by quoting MPEP 706.02(j) five separate times and insisting that the requirements of this section had been satisfied. Language from the secondary references is also quoted. However, an explanation as to how the primary references should be modified has still not been provided in connection with any of the rejections. It is respectfully submitted that a prima facie case of obviousness has not been presented in connection with any claim, and all claims are submitted to be allowable over the art of record for at least this reason.

B. Claims 1-4, 6-9, 11, 15, 17, 24-29 and 32-36 Patentably Distinguish Over Brendel in View of Joffe

Claim 1

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe. Claim 1 recites a method of selecting a server to represent a virtual server hosted by a plurality of servers that includes providing, by a load balancer not associated with the virtual server, values, for one or more parameters, of two or more paths. Each path is defined between a point in a vicinity of a client accessing the virtual

server and one of the plurality of servers representing the virtual server. The method also includes selecting a server to provide data for the client, responsive to the values of the one or more parameters, and that the load balancer is a client-controlled load balancer that directly selects one of the plurality of servers representing the virtual server based on the one or more parameters.

The examiner acknowledges that Brendel does not teach at least providing by a load balancer values for one or more parameters, of two or more paths, each path defined between a point in a vicinity of a client accessing the virtual server and one of the plurality of servers representing the virtual server. The examiner indicates that some modification to Brendel should be made based on the teachings of Joffe. However, the modification to Brendel that is being proposed is not identified in the Office Action, MPEP 706.02(j) has not been satisfied, and as discussed above, a prima facie case of obviousness has not been presented in connection with claim 1.

It is also not clear what modification to Brendel could be suggested by Joffe. Joffe discloses a system in which individual servers use ICMP pings to determine ICMP routing times between themselves and a browsing client's machine (column 12, lines 1-4). Thus, Joffe might suggest that servers in Brendel determine routing times to Brendel's client, but this is not the invention of claim 1. Indeed, Joffe teaches away from modifying client-side devices in any manner at column 2, lines 44-51, where he explains that load balancing involving client machines is undesirable because it requires an effort to make sure all clients are running proper software. The record contains no reason to modify Brendel based on Joffe, and Joffe appears to teach away from the claimed invention.

A proper reason for modifying Brendel, as required by *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007), has also not been presented. The reason provided in the final Office Action is that modifying Brendel “would improve the system of Brendel by providing a technique for dynamically selecting appropriate server from which to retrieve data object for a user based upon the user’s request, shortest network path, the capabilities and topology of the underlying network thus, efficiently using resources and optimally responding to user’s request by reducing wait time.” This statement does not make sense and is not supported by the cited portion of Joffe. For example, while Joffe discusses “automatic” actions, no such “dynamic” selection is mentioned. Moreover, Joffe discloses a complete system that is intended to reduce the wait time associated with prior art load balancers; nothing in the record suggests how such teachings would “reduce wait time” for Brendel or make Brendel satisfy the limitation of claim 1. The fact that a proper reason for modifying Brendel has not been provided further shows that a prima facie case of obviousness has not been presented.

#### Claims 2-4, 6-9, 11, 15 and 17

Claims 2-4, 6-9, 11, 15 and 17 depend from claim 1 and are submitted to be allowable for at least the same reasons as claim 1.

#### Claim 24

Claim 24 recites a method of selecting a server to be accessed that includes receiving by a load balancer a message relating to a virtual server, hosted by a plurality of servers, and to a client desiring to receive data from the virtual server. The method

also includes selecting by the load balancer one of the plurality of servers to provide data to the client based on one or more parameters related to a path to the client. The load balancer is closer to the client than to the selected server, and the load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server based on said one or more parameters. The examiner acknowledges that Brendel does not teach at least selecting by a load balancer one of a plurality of servers to provide data to a client based on one or more parameters related to a path to the client. However, the examiner indicates that Joffe addresses this shortcoming of Brendel.

It is respectfully submitted that the rejection of claim 24 does not present a prima facie case of obviousness because it does not comply with the requirements of MPEP 706.02(j) as discussed above. Furthermore, the reason for modifying Brendel provided in connection with claim 24 is identical to the reason provided for modifying Brendel in connection with claim 1 and is deficient for the reasons provided above in connection with claim 1. Claim 24 is submitted to be allowable over Brendel and Joffe for at least the reasons provided above in connection with claim 1.

#### Claims 25-29 and 32-36

Claims 25-29 and 32-36 depend from claim 24 and are submitted to be allowable for at least the same reasons as claim 24.

C. Claim 5 Patentably Distinguishes Over Brendel in View of Joffe and Zaumen

Claim 5

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of Zaumen. Claim 5 depends from claim 1. Zaumen does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claim 5 is therefore submitted to be allowable for at least the reasons provided above in connection with claim 1.

The reason provided for modifying Brendel and Joffe based on Zaumen also does not make sense. Claim 5 recites that the previously recited one or more parameters comprise a cost of communication. The examiner's reason for modifying Brendel and Joffe is that the modification would provide "a technique for simultaneously minimizing congestion and balancing load on a plurality of servers," which has nothing to do with the language of claim 5. A proper reason for modifying Brendel and Joffe has not been presented, and claim 5 is submitted to be allowable over the art of record for this reason as well.

D. Claim 10 Patentably Distinguishes over Brendel in view of Joffe and Schulter

Claim 10

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of Schulter. Claim 10 depends from claim 1. Schulter does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claim 10 is therefore submitted to be allowable for at least the

same reasons as claim 1.

The reason provided for modifying Brendel and Joffe based on Schulter also does not make sense. Claim 10 recites that “measuring at least one of the parameters for at least one of the paths is performed after receiving the connection establishment request.” The examiner indicates that Schulter teaches “allowing for optimal use of system resources by only establishing connection when it is determined that the requested service is available.” The meaning of this statement in connection with Brendel and Joffe, especially when no specific modification to the references has been identified, cannot be determined from the record. A proper reason for modifying Brendel and Joffe based on Schulter has not been provided, and claim 10 further distinguishes over the art of record for this reason.

E. Claim 12 Patentably Distinguishes over Brendel in view of Joffe and Cohen

#### Claim 12

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of Cohen. Claim 12 depends from claim 1. Cohen does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claim 12 is therefore submitted to be allowable for at least the same reasons as claim 1.

F. Claims 13, 14, 30 and 31 Patentably Distinguish Over Brendel in view of Joffe and Rune

Claims 13 and 14

Claims 13 and 14 depend from claim 1. Rune does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claims 13 and 14 are therefore submitted to be allowable for at least the same reasons as claim 1.

In addition, the reason provided for modifying Brendel and Joffe based on Rune does not make sense. Claim 13 recites the method of claim 1 further comprising transmitting an IP address of the selected server to the client. Claim 14 further limits claim 13 by reciting that transmitting the IP address of the selected server to the client comprises transmitting a DNS response. The reason provided by the examiner for modifying Brendel and Joffe is that this would provide “a hierarchical naming system for computers, services, or any resource participating in the Internet for translating domain name meaningful to humans into the numerical (binary) identifiers associated with networking equipment for the purpose of locating and addressing devices world-wide.” The stated reason has nothing to do with the limitations of claims 13 and 14, a proper reason for modifying Brendel has not been provided, and claims 13 and 14 are submitted to further distinguish over the art of record for these reasons.

Claims 30 and 31

Claims 30 and 31 depend from claim 24. Rune does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 24. Claims 30 and 31 are therefore submitted to be allowable for at least the same reasons

as claim 24.

The examiner provides the same reason for modifying claims 30 and 31 as was provided in connection with claims 13 and 14. This reason has nothing to do with the limitations of claims 30 and 31. Claims 30 and 31 are submitted to be allowable over the art of record for this reason as well.

G. Claim 16 Patentably Distinguishes Over Brendel in View of Joffe and Zisapel

Claim 16

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of Zisapel. Claim 16 depends from claim 1. Zisapel does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claim 16 is submitted to be allowable for at least the same reasons as claim 1.

H. Claims 18-21 Patentably Distinguish Over Brendel in view of Joffe and Yousefi'zadeh

Claims 18-21

Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Joffe and further in view of Yousefi'zadeh. Claims 18-21 depend from claim 1. Yousefi'zadeh does not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claims 18-21 are therefore submitted to be allowable for at least the same reasons as claim 1.



- I. Claims 22 and 23 Patentably Distinguish Over Brendel, Joffe and Yousefi'zadeh in view of Ebrahim

Claims 22 and 23

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel, Joffe and Yousefi'zadeh and further in view of Ebrahim. Claims 22 and 23 depend from claim 1. Yousefi'zadeh and Ebrahim do not address the shortcomings of Brendel and Joffe discussed above in connection with claim 1. Claims 22 and 23 are therefore submitted to be allowable for at least the same reasons as claim 1.

- J. Claims 37-40 Patentably Distinguish Over Brendel in View of Zaumen

Claim 37

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Zaumen. Claim 37 recites a method of selecting a server to be accessed that includes receiving by a load balancer a message relating to a virtual server that is hosted by a plurality of servers, and to a client desiring to receive data from the virtual server. The method also includes selecting, by the load balancer, one of the plurality of servers to provide data to the client, at least partially responsive to the cost of communications between the client and one or more of the plurality of servers. The load balancer is a client-controlled load balancer that directly selects one of the plurality of servers representing the virtual server based on one or more parameters.

The examiner acknowledges that Brendel does not show or suggest selecting by

the load balancer one of the plurality of servers to provide data to the client at least partially responsive to the cost of communications between the client and one or more of the plurality of servers. The examiner indicates that Zaumen addresses this shortcoming of Brendel; however, the modification to Brendel that is being proposed is not identified, MPEP 706.02(j) is not satisfied, and a prima facie case of obviousness is not presented in connection with claim 37.

Furthermore, it does not appear that Zaumen suggests any change to Brendel that would result in the invention of claim 37. Zaumen is directed to determining desirable routes in a network between first and second identified endpoints; Zaumen also describes measuring the qualities, including communications costs, of multiple pathways. It is not clear how determining an optimal route between two given nodes of a network suggests a modification to Brendel's system that would produce a method that includes selecting a server using a client-controlled load balancer as recited in claim 37. Claim 37 is submitted to be allowable over Brendel and Zaumen for at least this reason.

#### Claim 38

Claim 38 depends from claim 37 and is submitted to be allowable for at least the same reasons as claim 37. In addition, the rejection of claim 38 in the final Office Action contains no reason for making any modification to Brendel. Claim 38 is submitted to be allowable over the art of record for this reason as well.

#### Claim 39

Claim 39 depends from claim 37 and is submitted to be allowable for at least the same reasons as claim 37. In addition, the rejection of claim 39 in the final Office Action contains no reason for making any modification to Brendel. Claim 39 is submitted to be allowable over the art of record for this reason as well.

#### Claim 40

Claim 40 depends from claim 37 and is submitted to be allowable for at least the same reasons as claim 37. In addition, the rejection of claim 40 in the final Office Action contains no reason for making any modification to Brendel. Claim 40 is submitted to be allowable over the art of record for this reason as well.

K. Claims 41-45 Patentably Distinguish Over Brendel in view of Ebrahim

#### Claim 41

Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Ebrahim. Claim 41 recites a load balancer that includes, inter alia, an interface adapted to receive server access messages from clients and a processor adapted to determine, for at least one of the messages, whether the message requires load balancing. The determining is responsive to at least one attribute different from the identity of the server referenced by the message. The processor comprises a client-controlled processor that directly selects the server to service the client based on the at least one attribute. The examiner acknowledges that Brendel does not show at least determining whether a message requires load balancing responsive to at least one

attribute different from the identify of the server referenced by the message. However, Ebrahim is cited to address this shortcoming of Brendel. The examiner does not explain what modification to Brendel is being proposed based on Ebrahim, does not satisfy the requirements of MPEP 706.02(j), and does not present a prima facie case of obviousness in connection with claim 41.

Furthermore, it is not clear what modification to Brendel might be suggested by Ebrahim. Ebrahim teaches a system for context-dependent name resolution. In Ebrahim, the particular one of several destination hosts that is selected is determined in part based on the “caller” of the host (column 4, lines 7-13). This in no manner suggests any change to Brendel that would allow a determination regarding whether a message requires load balancing. Ebrahim does not suggest any change to Brendel that would result in the invention of claim 41, and claim 41 is submitted to be allowable over Brendel for at least this reason.

#### Claim 42

Claim 42 depends from claim 41 and is submitted to be allowable for at least the same reasons as claim 41. In addition, the rejection of claim 42 in the final Office Action contains no reason for making any modification to Brendel. Claim 42 is submitted to be allowable over the art of record for this reason as well.

#### Claim 43

Claim 43 depends from claim 41 and is submitted to be allowable for at least the same reasons as claim 41. In addition, the rejection of claim 43 in the final Office Action

contains no reason for making any modification to Brendel. Claim 43 is submitted to be allowable over the art of record for this reason as well.

#### Claim 44

Claim 44 depends from claim 41 and is submitted to be allowable for at least the same reasons as claim 41. In addition, the rejection of claim 44 in the final Office Action contains no reason for making any modification to Brendel. Claim 44 is submitted to be allowable over the art of record for this reason as well.

#### Claim 45

Claim 45 depends from claim 41 and is submitted to be allowable for at least the same reasons as claim 41. In addition, the rejection of claim 45 in the final Office Action contains no reason for making any modification to Brendel. Claim 45 is submitted to be allowable over the art of record for this reason as well.

- L. Claim 46 Patentably Distinguishes Over Brendel and Ebrahim in View of Cohen

#### Claim 46

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Ebrahim and further in view of Cohen. Claim 46 depends from claim 41. Cohen does not address the shortcomings of Brendel and Ebrahim discussed above in connection with claim 46. Claim 46 is therefore submitted to be allowable for at least the same reasons as claim 41.

In addition, the reason provided for modifying Brendel and Ebrahim is not related

to the limitation at issue. Claim 46 recites that a packet changing unit recited in claim 41 is adapted to change packets in accordance with half NAT or full NAT procedures. The reason provided for modifying Brendel and Ebrahim is to provide “a technique for re-writing destination address/source address or both, making it appear to the server that all connections are origination from the load balancer, thus hiding the distributed nature of the system from the servers.” This statement does not constitute a reason for making any modification to Brendel and Ebrahim, and claim 46 is submitted to further distinguish over the art of record for this reason.

M. Claims 47, 50 and 51 Patentably Distinguish Over Brendel in View of Yousefi'zadeh

Claims 47, 50 and 51

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Yousefi'zadeh. Claim 47 recites a method of selecting a server to be accessed that includes receiving by a load balancer a message relating to a virtual server, hosted by a plurality of servers, and to a client desiring to receive data from the virtual server. The method also includes choosing a function from a plurality of predetermined functions utilized by the load balancer for selecting servers, responsive to the received message, and selecting, by the load balancer, one of the plurality of servers that minimizes or maximizes the chosen function, to provide data to the client. The load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server that minimizes or maximizes the chosen function.

The examiner acknowledges that Brendel does not show or suggest at least

choosing a function from a plurality of predetermined functions and selecting by a load balancer one of the plurality of servers that minimizes or maximizes the chosen function. Yousefi'zadeh is cited to address this deficiency. However, the examiner does not explain what modification to Brendel is being proposed, does not satisfy the requirements of MPEP 706.02(j), and does not present a prima facie case of obviousness in connection with claim 47.

Furthermore, it is not clear what modification to Brendel could be suggested by Yousefi'zadeh. Yousefi'zadeh discloses a load balancer for a plurality of servers that is associated with the servers in a conventional manner. Yousefi'zadeh thus has information regarding the loads of the servers and can send requests to servers in a variety of ways. However, nothing in Yousefi'zadeh suggests any modification to Brendel that would allow Brendel's system to provide such functionality. The combination of Brendel and Yousefi'zadeh does not show or suggest the invention of claim 47, and claim 47 is submitted to be allowable over these references for at least this reason.

Claims 50 and 51 depend from claim 47 and are submitted to be allowable for at least the same reasons as claim 47.

N. Claims 48 and 49 Patentably Distinguish Over Brendel in View of Yousefi'zadeh and Ebrahim

Claims 48 and 49

Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel in view of Yousefi'zadeh and Ebrahim. Claims 48 and 49 depend from

claim 47. Ebrahim does not address the shortcomings of Brendel and Yousefi'zadeh discussed above in connection with claim 47. Claims 48 and 49 are submitted to be allowable over the art of record for at least the same reasons as claim 47.

O. Claim 52 Patentably Distinguishes Over Ballard in View of Joffe

Claim 52

Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard in view of Joffe. Claim 52 recites a method of selecting a server to be accessed by a client via a wide area network (WAN) from among a plurality of servers associated with a domain name. The method includes providing a client-controlled load balancer in a local area network (LAN) connected to the WAN, the LAN including the client, receiving at the load balancer a list of addresses of servers hosting the domain name, selecting by the load balancer one of the addresses of the plurality of servers based on a parameter related to a path between a point in the vicinity of the client and one of the plurality of servers. The examiner indicates that Ballard discloses some of the above limitations and that it would have been obvious to modify Ballard based on Joffe to produce the invention of claim 52. However, the examiner does not identify the modification to Ballard that is being proposed, does not satisfy the requirements of MPEP 706.02(j), and does not present a prima facie case of obviousness in connection with claim 52.

Ballard discloses a system in which a client computer maintains a list of servers and selects one of the servers to use, in a random or round-robin manner, for example



(column 6, line 3; column 39-48). However, Ballard does not suggest selecting an address of a server based on a parameter related to a path between a point in the vicinity of the client and one of the servers as recited in claim 52. Joffe teaches away from client-based load balancers as discussed above in connection with claim 1 and provides no suggestion that Ballard should be modified in any manner. Claim 52 is submitted to be allowable over Ballard and Joffe for at least this reason.

- P. Claim 53 Patentably Distinguishes Over Ballard in view of Joffe and Ebrahim

Claim 53

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard in view of Joffe and further in view of Ebrahim. Claim 53 depends from claim 52. Ebrahim does not address the shortcomings of Ballard and Joffe discussed above in connection with claim 52. Claim 53 is therefore submitted to be allowable for at least the same reasons as claim 52.

- Q. Claim 54 Patentably Distinguishes Over Ballard in View of Joffe and Further in View of Vange

Claim 54

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard in view of Joffe and further in view of Vange. Claim 54 depends from claim 52. Vange does not address the shortcomings of Ballard and Joffe discussed above in connection with claim 52. Claim 54 is therefore submitted to be allowable for at least the same reasons as claim 52.

CONCLUSION

Reconsideration and allowance of claims 1-54 is earnestly solicited in view of the foregoing arguments.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 50-3828 and please credit any excess fees to such deposit account.

Respectfully submitted,

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VIII. Claims Appendix

1. A method of selecting a server to represent a virtual server hosted by a plurality of servers, comprising:

providing, by a load balancer not associated with the virtual server, values, for one or more parameters, of two or more paths, each path defined between a point in a vicinity of a client accessing the virtual server and one of the plurality of servers representing the virtual server; and

selecting a server to provide data for the client, responsive to the values of the one or more parameters,

wherein the load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server based on said one or more parameters.

2. A method according to claim 1, wherein the load balancer and the client are in the same metropolitan area.

3. A method according to claim 1, wherein the client-controlled load balancer resides between the client and the virtual server.

4. A method according to claim 1, wherein the one or more parameters comprise at least one of a jitter, a round trip delay or a hop count.

5. A method according to claim 1, wherein the one or more parameters comprise

a cost of communication.

6. A method according to claim 1, wherein selecting the server comprises selecting, by the client-controlled load balancer, responsive to receiving identification of a virtual server requested by the client.

7. A method according to claim 6, wherein selecting the server comprises selecting, by the client-controlled load balancer, responsive to receiving a connection establishment request from the client.

8. A method according to claim 6, wherein providing the values for the one or more parameters comprises measuring at least one of the parameters.

9. A method according to claim 8, wherein measuring at least one of the parameters, for at least one of the paths, is performed before receiving the connection establishment request.

10. A method according to claim 8, wherein measuring at least one of the parameters for at least one of the paths is performed after receiving the connection establishment request.

11. A method according to claim 1, further comprising changing the destination IP address of packets received by the load balancer from the client, to an IP address of

the selected server.

12. A method according to claim 1, further comprising changing the source IP address of packets received by the load balancer from the selected server.

13. A method according to claim 1, further comprising transmitting an IP address of the selected server to the client.

14. A method according to claim 13, wherein transmitting the IP address of the selected server to the client comprises transmitting a DNS response.

15. A method according to claim 1, wherein ones of the plurality of servers are located in different geographical regions.

16. A method according to claim 1, wherein selecting a server to provide data for the client comprises selecting, by the load balancer, a second load balancer which is to perform the server selection and selecting, by the second load balancer, a server to provide data for the client.

17. A method according to claim 1, wherein the virtual server hosts a web site.

18. A method according to claim 1, wherein selecting a server to provide data for the client comprises selecting a server which minimizes a function of the one or more

parameters.

19. A method according to claim 18, wherein selecting a server to provide data comprises choosing a function of the one or more parameters to be minimized and selecting a server which minimizes the chosen function.

20. A method according to claim 19, wherein the function is chosen responsive to a protocol with which the virtual server is accessed.

21. A method according to claim 19, wherein the function is chosen responsive to the virtual server accessed.

22. A method according to claim 19, wherein the function is chosen responsive to an attribute of the client.

23. A method according to claim 19, wherein the function is chosen responsive to the time of the selection.

24. A method of selecting a server to be accessed, comprising:  
receiving, by a load balancer, a message relating to a virtual server, hosted by a plurality of servers, and to a client desiring to receive data from the virtual server; and  
selecting, by the load balancer, one of the plurality of servers to provide data to the client based on one or more parameters related to a path to the client,

wherein the load balancer is closer to the client than to the selected server, and

wherein the load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server based on said one or more parameters.

25. A method according to claim 24, wherein the load balancer is closer to the client than to any of the plurality of servers hosting the virtual server.

26. A method according to claim 24, wherein the load balancer is in the same metropolitan area as the client.

27. A method according to claim 24, wherein the client-controlled load balancer resides between the client and the virtual server.

28. A method according to claim 24, wherein the load balancer is not associated with the virtual server.

29. A method according to claim 24, wherein the load balancer is under control of a system manager of the client.

30. A method according to claim 24, wherein receiving the message comprises receiving a DNS query message.

31. A method according to claim 24, wherein receiving the message comprises receiving from a DNS server.

32. A method according to claim 24, wherein receiving the message comprises receiving a connection establishment request directed to the virtual server.

33. A method according to claim 24, wherein receiving the message comprises receiving a message directed to the load balancer.

34. A method according to claim 24, wherein selecting one of the servers comprises selecting a server which has a lowest cost path to the load balancer.

35. A method according to claim 24, wherein selecting one of the servers comprises selecting a server which has a lowest delay path or a highest packet size path to the load balancer.

36. A method according to claim 24, wherein the load balancer is geographically closer to the client than to the selected server.

37. A method of selecting a server to be accessed, comprising:  
receiving, by a load balancer, a message relating to a virtual server, hosted by a plurality of servers, and to a client desiring to receive data from the virtual server; and  
selecting, by the load balancer, one of the plurality of servers to provide data to



the client, at least partially responsive to the cost of communications between the client and one or more of the plurality of servers,

wherein the load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server based on one or more parameters.

38. A method according to claim 37, wherein selecting one of the servers comprises selecting a server under a constraint that a lowest cost client communication connection is used in connecting to the server.

39. A method according to claim 37, wherein selecting one of the servers comprises selecting a server which minimizes a weighted sum of communication costs to the server and at least one other route related parameter.

40. A method according to claim 39, wherein selecting one of the servers comprises selecting a server which minimizes a weighted sum of the communication costs to the server and the round trip delay to the server.

41. A load balancer, comprising:  
an interface adapted to receive server access messages from clients; and  
a processor adapted to determine, for at least one of the messages, whether the message requires load balancing responsive to at least one attribute different from the identity of the server referenced by the message, and to select for at least one message

determined to require load balancing, a server to service the client,

wherein the processor comprises a client-controlled processor that directly selects the server to service the client based on the at least one attribute.

42. A load balancer according to claim 41, wherein the at least one attribute comprises the time at which the message is received at the interface.

43. A load balancer according to claim 41, wherein the at least one attribute comprises the identity of the client.

44. A load balancer according to claim 41, wherein the at least one attribute comprises a protocol to govern the communication with the server.

45. A load balancer according to claim 41, further comprising a packet changing unit adapted to change the contents of at least one field of packets belonging to connections for which load balancing was performed.

46. A load balancer according to claim 41, wherein the packet changing unit is adapted to change packets in accordance with half NAT or full NAT procedures.

47. A method of selecting a server to be accessed, comprising:  
receiving, by a load balancer, a message relating to a virtual server, hosted by a plurality of servers, and to a client desiring to receive data from the virtual server;

choosing a function from a plurality of predetermined functions utilized by the load balancer for selecting servers, responsive to the received message; and

selecting, by the load balancer, one of the plurality of servers that minimizes or maximizes the chosen function, to provide data to the client,

wherein the load balancer comprises a client-controlled load balancer that directly selects said one of the plurality of servers representing the virtual server that minimizes or maximizes the chosen function.

48. A method according to claim 47, wherein choosing the function comprises choosing responsive to an identity of the client.

49. A method according to claim 47, wherein choosing the function comprises choosing responsive to a time at which the message is received.

50. A method according to claim 47, wherein at least two of the predetermined functions depend on different groups of one or more parameters.

51. A method according to claim 47, wherein at least two of the predetermined functions depend on the same parameters but give different weight to one or more of the parameters on which they depend.

52. A method of selecting a server to be accessed by a client via a wide area network (WAN) from among a plurality of servers associated with a domain name

comprising:

providing a client-controlled load balancer in a local area network (LAN) connected to the WAN, the LAN including the client;

receiving at the load balancer a list of addresses of servers hosting the domain name; and

selecting by the load balancer one of the addresses of the plurality of servers based on a parameter related to a path between a point in the vicinity of the client and one of the plurality of servers.

53. The method of claim 52 wherein the parameter is time-variable.

54. The method of claim 52 wherein the parameter comprises a measure of communication quality.

*IX. EVIDENCE APPENDIX*

*(None)*

X. *RELATED PROCEEDINGS APPENDIX*

*(None)*